lines of somewhat greater wave-length. The bright lines accompanying K and Hϵ were reversed, and traversed by narrow, well-defined dark lines. These last lines, and one of somewhat shorter wave-length than Hβ, are the only sharply defined lines in the spectrum, all of the others being broad and hazy, and difficult to measure with accuracy.

Clouds interfered with observations on February 25, but the Nova was evidently much fainter than on the previous evening. Its magnitude from visual comparisons was 1·4, from photometric measures, 1·07. The spectrum differed slightly from that on February 24. The lines Hδ, Hγ and Hβ were also reversed and replaced by one or more narrow dark lines.

On February 26 the magnitude from visual comparisons was 1·3, from photometric measures 1·49. The changes in the spectrum were slight.

Observations of the position of the Nova were made by Mr. J. A. Dunne, with the 8-inch meridian circle, on February 23, 24 and 25, with the result for 1900·0, R.A. 3h. 24m. 24s·02, Decl. + 43° 33′ 42″·4.

It therefore appears that on and before February 19, 1901, the star was invisible, or at least fainter than the eleventh magnitude. On February 21 its magnitude was 2·7, according to Mr. Anderson. On February 22 its magnitude was 0·5, perhaps becoming a little brighter on February 23, and then diminishing, so that on February 25 its magnitude was 1·1. Its spectrum on February 22 and 23 was of the Orion type, nearly continuous, traversed by narrow dark lines. During the next twenty-four hours an extraordinary change took place, so that on February 24 the spectrum resembled that of the other Novæ. It was traversed by bright and dark bands, and the principal dark lines had accompanying bright lines of slightly greater wave-length.

During the last fourteen years, and since the general application of photography to astronomy, eight new stars are known to have appeared—Nova Persei, in 1887; Nova Aurigæ, in 1891; Nova Normæ, in 1893; Nova Carinæ, in 1895; Nova Centauri, in 1895; Nova Sagittarii, in 1898; Nova Aquilæ, in 1899; and Nova Persei, in 1901. The second and last of these, which were much brighter than the others, were found visually by Dr. Anderson. All of the others were found by Mrs. Fleming, from an examination of the Draper Memorial Photographs. Nova Aquilæ was announced by telegraph, but has not been described in these circulars. Its position for 1900 is R.A. 19h. 15m.·3, Decl. − 0° 19′. It was not seen on plates taken on November 1, 1898, and earlier, although stars of the thirteenth magnitude appeared on some of them. On April 21, 1899, it was seventh magnitude. It appears on eighteen photographs taken during that summer, and on October 27, 1899, it was tenth magnitude. In July, 1900, when it was discovered, it was about twelfth magnitude. Seven bright lines—Hζ, Hϵ, Hδ, Hγ, 4693, Hβ and the nebular line 5007—were seen in the spectrum photographed on July 3, 1899. On September 7, 1899, Hγ and a somewhat fainter line, which is probably 4959, were the only bright lines visible. On October 27, 1899, Hγ and 5007 were alone visible and bright, so that the spectrum had then become that of a gaseous nebula.

EDWARD C. PICKERING.

NOTES.

AMONG other noteworthy remarks made by speakers at the jubilee dinner of the Royal School of Mines, on March 13, was one in which Sir George Kekewich, secretary of the Board of Education, acknowledged that science must occupy a place in any wise system of education. He said, "I should like to see the day when no education can be regarded as a liberal education which excludes a knowledge of science. In addition, I should like to see no one matriculating at any University in this kingdom who does not possess some knowledge of science. Indeed, I should like to see it recognised as part of the general education of every man who has any claims to possess a liberal education." The dinner was largely attended by past and present professors and students at the College. The chair was occupied by Sir George Gabriel Stokes, and toasts were proposed and acknowledged by the chairman, Sir Kenelm Digby, Prof. J. W. Judd, Sir William Roberts-Austen, Sir George Kekewich, Sir William Huggins, Prof. Le Neve Foster, Mr. Bennett Brough, Prof. W. A. Tilden, Prof. Milne, Mr. F. W. Rudler, Prof. Bauerman, Prof. J. Perry and Mr. Hugh McNeill, the secretary. The chairman described the gradual development of the School of Mines, and referred to the humble way in which it was established. "Even still," he remarked, "it bears indications of the tentative mode of proceeding to which I have already alluded, for Sir Norman Lockyer's elaborate work in astronomical spectroscopy, so far as taking observations on the heavenly bodies is concerned, is carried on in buildings of the nature of sheds." Sir William Roberts-Austen made mention of Stokes, Playfair, Hofmann, Huxley, Tyndall, Warington Smyth, and other brilliant men of science who had been connected with the College; and other speakers showed how professors and students have played important parts in various fields of scientific and industrial activity.

THE death is announced of M. Theodore Moutard, distinguished by his contributions to geometry.

M. A. NORMAND has been elected a correspondant of the Paris Academy of Sciences, in succession to the late General Alexis de Tillo.

THE ninth triennial conference of the German Meteorological Society will be held at Stuttgart on April 1, 2 and 3, the first half of Passion week, as Easter week, the usual time of the meeting, has been set apart for the Seismological Conference at Strassburg. Hail will form one of the principal subjects for discussion.

IT has been decided to hold the seventy-third meeting of the German Association of Naturalists and Physicians at Hamburg from September 22 to 28 next. In response to many representations there has been a rearrangement of the sections, which have hitherto numbered thirty-eight, but will in future be reduced to twenty-seven, and of these sixteen will be medical sections.

IT is reported that the grave of Hippocrates has just been discovered during excavations at Larissa, in Thessaly. A Royal Commission has been sent to the place by the Greek Government to take what measures may seem advisable.

THE *British Medical Journal* announces that Dr. C. W. Daniels has been appointed superintendent and medical tutor of the London School of Tropical Medicine, in succession to Dr. D. C. Rees. Dr. Daniels served on the Royal Society's Malaria Commission in 1898 for two years, and is now seconded for a further period whilst filling his present appointment at the London School of Tropical Medicine.

THE zoological lectures of the Zoological Society of London will be delivered in the Society's meeting room this year on Thursdays April 18, May 16, June 20 and July 18 at 4.30. The first lecture will be given by Prof. C. Stewart, F.R.S., conservator at the Royal College of Surgeons, and will relate to the various devices of nature for the protection and nourishment of young fishes. The lectures are free to Fellows of the Society.

THE latest number of the *Zeitschrift für wissenschaftliche Zoologie* (vol. lxix. part 2) contains three articles dealing with invertebrates. The first, by Herr J. Grofs, treats of the ovary of hemipterous insects; in the second, Herr C. Dawydoff treats of the process of regeneration among the brittle stars; while in the third, Herr O. Bütschli gives the results of his investigations into the nature of siliceous and calcareous sponge-spicules. In the latter it is shown that sponge-spicules, under the influence of heat, display minute cavities, which it is inferred exist under normal conditions, although too small to be detected. The composition of both the organic and inorganic constituents of the calcareous spicules is worked out, the mineral matter being a double salt of $CaCO_3$ and K_2CO_3.

SERIOUS students of the science of meteorology will welcome Dr. J. Hann's "Lehrbuch der Meteorologie," the publication of which has just been commenced by the firm of Tauchnitz, Leipzig. The work will be completed in eight parts, and it is to be hoped that they will follow one another in quick succession. The first part contains a general introduction on the physics and chemistry of the atmosphere, and sections on radiation and daily and annual ranges of temperature. There are also charts showing the isotherms of the world in January, July, and of the year, and also representing the paths of hurricanes in the North Atlantic Ocean. The work will be reviewed when all the parts have been received.

WE have already referred on two or three occasions to the dispute between the authorities of Kew Observatory and the West London Tramways. The subject of the dispute—whether the currents leaking from the tramway rails would affect the readings of the magnetometers at Kew—was put to the test of experiment on Friday last, when the Board of Trade inspection of the electrical equipment of the Tramways was carried out by Mr. Trotter. For an hour or two the ordinary horse-car trams were replaced by electrically-driven cars, thirty of which were run on the line between Hammersmith and Kew. During this trial observations were made on the measuring instruments in the generating station by Mr. R. T. Glazebrook on behalf of Kew Observatory. It will be possible, by comparing the records thus obtained with the readings of the instruments at Kew during the time of the trial, to determine how far the leakage currents are likely to interfere with the value of the Kew records. Should an appreciable effect be observed, an arrangement will have to be made between Kew and the Tramways as to the amount of compensation to be paid by the latter for the cost of removing the instruments.

THE prospects of agricultural developments in South Africa were described by Prof. R. Wallace at a meeting of the Colonial Institute on March 12. After referring in detail to the crops produced in Cape Colony, the scanty herbage, the rearing of sheep and goats, the production of wool, ostrich-farming, the breeding of cattle, forest areas, and the products of Natal, he alluded to the Transvaal and the Orange River Colony. The south-eastern parts of the Transvaal, including New Scotland, he said, were specially suitable for sheep-breeding as well as for agriculture, the high central area for cattle and corn, the northern and lower elevations for coffee and sugar plantations and for tropical fruit culture. Good tobacco was largely grown in the Transvaal for export to other districts of South Africa. A great deal had been written about irrigation being the probable salvation of the country. Many small local ventures had been marvellously successful in transforming what was desert into gardens of Eden, and a good many promising irrigation schemes had been examined in various districts of Cape Colony, but most of them involved the expenditure of a large amount of capital and would require to be worked with much skill and care to make them pay. Without irrigation, the extent of South Africa that was capable of cultivation with satisfactory results was an infinitesimal fraction of the whole, and even that was subjected to periodical droughts which at times destroyed a whole season's crop; to destructive hailstorms, which were specially prevalent on the central plateau; and to fungoid parasitic pests on the common grain crops, which made the growth of European cereals practically impossible during the wet season of summer. It was highly probable that among the new disease-resisting breeds of cross-fertilised grains which had been produced at Newton-le-Willows by the brothers Garton, species of both oats and wheat might be found on experiment to overcome this difficulty; but still sufficient reasons remained why South Africa would never be a great agricultural country capable of exporting grain. With the development of the local irrigation schemes that were possible and better systems of management, it might more nearly produce the amount of food requisite for internal consumption.

THE *Newcastle Daily Journal* announces the death of Mr. Richard Howse, one of the old school of naturalists, who had been for half a century actively identified with the Natural History Society in Newcastle, and since the new museum was opened at Barras Bridge sixteen years ago he discharged the duties of curator. For a considerable period he acted as one of the secretaries to the Tyneside Naturalists' Field Club, and was also editor of its transactions. Mr. Howse was one of the first geologists to study the Permian rocks of the north-east coast, and he made a number of important observations of the carboniferous fossils of the north of England, many interesting specimens of which have been named after him. He was a prolific writer, and in addition to many papers which were published in the transactions of the local societies, he prepared an interesting "Guide to the Natural History Museum." He compiled other volumes dealing with the exhibits in the Barras Bridge Museum, amongst the number being a "Guide to the Collections of Local Fossils," and a "Catalogue of the Fishes of the Rivers and Coast of Northumberland and Durham." Prior to this publication, no systematic list of the fishes found on the coast and in the rivers of Northumberland and Durham had been issued. Mr. Howse also published an index catalogue of birds in the Hancock collection and a catalogue of Permian fossils, and was joint editor with Mr. J. W. Kirby of a "Synopsis of Geology of Northumberland and Durham."

A METHOD of distinguishing human blood from that of animals has been discovered independently by Dr. Uhlen-Luth, of Greifswald, and Drs. Wassermann and Schutze, of Berlin, and is described in the *Medical Press and Circular* of March 13. From this account of the investigations it appears that it is now possible to obtain a definite reaction from blood-stains, however old, which indicates with something approximating absolute certainty the source of the blood under examination. This result is based on the fact that the blood serum of animals which have been injected with the blood of an animal of a different species, when added to a dilution of blood from the latter, produces therein a well-marked precipitate. Thus, if a rabbit be injected with human blood, the serum of the rabbit blood, when added to a dilution of human blood, causes immediate turbidity, a phenomenon which is conspicuous by its absence when it is added to dilutions of any other kind of blood. The only element of uncertainty is that the blood of monkeys reacts, to some extent, in the same way as human blood; but apart from the fact that the medico legist is seldom likely to be called upon to differentiate between these two varieties, there is a notable difference in the length of time required for a dilution of monkey's blood to become cloudy as compared with that of man. Full details of the procedure will be found in our contemporary.

THE Meteorological Council have just published a series of charts illustrating the weather of the North Atlantic Ocean in the winter 1898–9. This period was marked by a succession of severe gales, and it will be remembered that public interest was especially aroused by the anxiety as the safety of the liners *Pavonia* and *Bulgaria*. The charts illustrate the state of the weather from December 18, 1898, to February 15, 1899, com piled from observations from the log-books of some 200 vessels, and show that during the month of January and the first half of February the weather was exceedingly boisterous, and the period was also noteworthy by the great difference of temperature between the eastern and western shores of the Atlantic. For instance, between Fort Logan, in Montana (latitude 47° N.), with its terribly severe frost of −61° in the night of February 10, and Liège in Belgium (latitude 48° N.), with its temperature of 70°·5 on the afternoon of the 10th, there was a difference of 131°·5, while over extensive regions of America and western Europe there was a difference of more than 100°. This combination of circumstances seemed to indicate the occurrence of some peculiar atmospheric conditions of which the Meteorological Council considered a permanent record was desirable.

THE *Proceedings* of the American Academy of Arts and Sciences for January contain a description of an ingenious apparatus devised by Mr. F. A. Laws for recording alternating current waves. The system is a modification of the "point-to-point" or "contact" method; by a mechanical arrangement which automatically shifts the position of the contact brushes, the galvanometer deflection instead of being changed intermittently is made to alter gradually, thus slowly following the wave-form. The reflected spot of light is received on a moving photographic plate on which it imprints a record of the wave-form. The method only gives the average wave-form, but inasmuch as this is obtained in a few minutes, it is a considerable improvement on the older "point-to-point" systems. But now that oscillographs have been developed into thoroughly practical instruments by Blondel, Duddell and others, the "point-to-point" method must be regarded, we think, as having had its day.

SOME experiments on the heat evolved when powders are wetted are described by Signor Manfredo Bellati in a recent pamphlet (printed by Carlo Ferrari, of Venice, 1900). It has been suggested as an explanation of the phenomena that the heating is due to the compression produced in the stratum of liquid immediately surrounding the solid, and this explanation has been confirmed by the experiments of Jungk, according to which, when the water is below 4° C., cooling, instead of heating, takes place, such as would occur in water below the temperature of maximum density when subjected to an increase of pressure. This result has been negatived by the experiments of Meissner. The present writer points out, however, that since the effect of pressure is to lower the point of maximum density, it does not necessarily follow that cooling must always occur at temperatures below 4° C., and hence the above hypothesis is not necessarily inconsistent with Meissner's results. In Signor Bellati's experiments dry sand was found to become heated when wetted with water even at a temperature of 0° C. When the sand had been previously moistened, however, the author found that at 0° C. heating occurred when the sand contained more than 2·1 or less than 1·4 per cent. of water, but that with percentages between these limits cooling sometimes took place instead. The author describes some further experiments conducted with the object of testing Canton's and Martini's theory.

IN addition to other communications, the second part of the Bergens Museum *Aarbog* contains two papers, one by Mr. O. Nordgaard and the second by Mr. E. Jorgensen, dealing with the "plankton" of the North Sea, as well as one by Emily Arnesen, treating of the sponges of the Norwegian coasts. In the *fjords* of western Norway it is ascertained that the deep plankton fauna is of an Arctic character; copepods existing in the deep layers, where Atlantic conditions prevail, which attain their maximum development, both as regards size and number, in the Arctic Ocean. We have likewise received the *Aarsberetning* of the Bergen Museum, in which we notice an excellent reproduction of a photograph of a portion of the zoological gallery.

THE first fasciculus of an important work on the Hydroids, or Hydromedusæ, of the North American seas, now in course of publication by the Smithsonian Institution as *Special Bulletin* No. 4, has been received. The rich material for the history of this group of zoophytes accumulated in the U.S. National Museum, as one of the results obtained by numerous dredging expeditions of late years, has never hitherto been worked out, and the detailed investigation now being undertaken promises very important additions to our knowledge of the group. The present fasciculus, by Prof. C. C. Nutting, of Iowa University, deals with the Plumulariidæ, of which it is doubtful if more than fifty North American species were previously known. The result of the investigation is to show that, in place of Australia, the West Indian area is the richest in plumularian life of any region of the equal size in the world.

WE have received the *Sitzungsberichte* of the Royal Bohemian Society for 1900, which forms a thick volume containing, among other matter, nine articles on zoological and the same number on botanical subjects. Of the former perhaps the most interesting is one by Dr. A. Mrázek, describing the discovery of a small freshwater nemertine worm in a tank in one of the hothouses in the Botanical Garden at Prague. So little is at present known of the freshwater representatives of this group that every new fact is of importance; but since specimens have been found in regions so far apart as Nicaragua and Turkestan, there can be little doubt that some forms are indigenous to freshwater. The specimen described by Dr. Mrázek is identical with *Stichostoma* or *Tetrastemma, graecense*, of which the other known example was taken in a warm-water tank in the Botanical Garden at Gratz; the species is, therefore, probably introduced. The author adds some general remarks with regard to freshwater faunas.

THE issue of the *Revue Scientifique* (*Revue Rose*) of March 9 contains a long and interesting article by M. Louis-Adrien Levat on the destruction of birds, especially by means of traps and snares, which he declares to be illicit. After a brief survey of the persecution to which birds were exposed in ancient times, and reference to the fact that taking the hen sitting on her nest is expressly forbidden by the Mosaic code, the author goes on to say that during a single spring a few years ago no less than 1500 nests were taken in one French province. This represents a prospective loss of about 6000 birds, which might be expected to consume some 6,000,000 insects among them. He adds the significant observation that in the year 1860 one hundred cages filled with insectivorous birds of various kinds were exported from Baden to New South Wales; and that at the present day it would be almost impossible to send such another cargo, owing to the scarcity of these birds on the continent. And it is not alone the disappearance of bird-life and bird-song from the country districts that is to be deplored. The effects on agriculture, horticulture and the grape industry are simply disastrous. Some birds, it is computed, will consume 200,000 insects per season, and others as many as 600 per day. A single insect-eating species may be the means of saving 3200 grains of wheat and 1150 grapes daily! In Hérault alone the destruction of insectivorous birds is calculated to cost the department 100,000 hectolitres of wine annually. And in some districts of France the country is practically desolated by insect ravages owing to bird-slaughter. From the fact that in France so-called sportsmen are in the habit of shooting small birds, the situation is much worse than in England. Remedial measures are urgently needed, but the author says he is preaching to deaf ears.

THE Trinidad *Bulletin of Miscellaneous Information* states that a recent analysis made by Prof. Carmody, Government Analyst, confirms the previous work of Francis as to the presence of prussic acid in sweet cassava, the proportion found varying from 0·005 to 0·019 per cent. The skin was found to yield from 0·014 to 0·042 per cent., while the inner part gave only 0·003 to 0·015 per cent. The interior part of bitter cassava yielded 0·013 to 0·037 per cent., while the skin and outer layer yielded from 0·012 to 0·035 per cent. Peeling sweet cassava before cooking is therefore a wise precaution. Prof. Carmody also suggests that the acid may in part be formed by fermentative change.

MR. C. THOM (*Trans.* Acad. Sci. St. Louis, ix. No. 8) gives an account of the details of fertilisation as observed in ferns belonging to the genera Aspidium and Adiantum. In describing the development of the spermatozoa he states that a blepharoplast is present in the cytoplasmic part, and that the nuclear portion really consists of a hollow tube, chiefly composed of chromatin, enclosing a core of a substance probably representing a transformation of nucleolar matter. When the sperm reaches the archegonium, the cytoplasmic envelope becomes more or less functionless, and the nuclear part wriggles to the egg by an autonomous movement. The cytoplasmic portion containing the blepharoplast either is thrown off before the egg is entered or it is detached and disintegrates in the egg cytoplasm. Hence the importance which has been ascribed to this body, as the result of a comparison with animal centrosomes would seem to have been exaggerated. The coiled nuclear part of the sperm enters the nucleus of the egg, in which it can be recognised for some time. Ultimately, however, the mixing of the egg and sperm nuclear constituents becomes so complete that finally no difference between the sexual elements can be detected.

THE report of the work of the Division of Forestry of the U.S. Department of Agriculture during the year 1900 has been issued. The year witnessed a conspicuously wider and more effective and intelligent interest in forest matters in the United States than any previous year. To give an idea of the extent of the work it may be mentioned that during the year applications were received for working plans for 48,078,449 acres, personal examinations on the ground were made of 2,103,670 acres, working plans were begun upon 1,325,000 acres; plans were completed for 179,000 acres, and 54,000 acres were put under management. In accordance with the request of the Secretary of the Interior, the preparation of a working plan for the Black Hills Forest Reserve was begun as the first step toward conservative lumbering on the national forest reserves. A unique and most promising study of the effect of forest cover on the flow of streams has been commenced in southern California upon the lands of the Arrowhead Reservoir Company, whose observations of precipitation, run off, evaporation and temperature for eight years have been placed at the disposal of the Division of Forestry. A careful study of the subordinate watersheds, which differ completely among themselves in the character of their forest covering, has been undertaken, and strong hopes are entertained of valuable results from the comparison of the run-off from various types of cover. An investigation of the value of the widespread views regarding the effect of denudation upon the once forested lands bordering the Mediterranean Sea has been begun, and the conditions in Tunis, Algeria and Tripoli have been studied.

WE have received a reprint from the Twelfth Annual Report of the Missouri Botanic Garden, a monograph of the Crotons of the United States, by Mr. A. M. Ferguson. It includes about twenty-four species, and is illustrated by thirty-one plates.

A DAINTY and cheap edition—the price is only eighteenpence net—of Izaak Walton's "Complete Angler," has been published by Messrs. Gay and Bird. This matchless idyl of angling and its associations, first appeared in 1653, and the present volume is a reprint of the text of the fifth edition (1676), as revised by Sir John Hawkins. The book is just the kind of volume to slip into the coat pocket, to be read at quiet moments by contemplative naturalists, whether anglers or ramblers, who find pleasure in observing nature.

SEVERAL interesting articles upon scientific subjects appear in the March magazines which have come under our notice. The *Idler* contains an instructive description of the Jena glass works and of Prof. Abbe's researches. Mr. Walter Wellman describes some experiences of his Polar expedition of 1898–1899. A fine series of instantaneous photographs showing the forms assumed by water thrown out of a bucket is reproduced in *Pearson's Magazine.* Dr. Louis Robinson describes popularly how adaptation to environment may lead to the survival of such animals as the giraffe, camel and zebra; and a description is given of a trip in an immersible boat, the *Argonaut.* In *Scribner's Magazine* some of the geographical discoveries made between 1825 and 1900 are shown by comparative maps. *Good Words* contains articles on Mr. Edison, insect pests, and the building of the locomotive.

THE current number of the *Berichte* contains a paper by W. Ipatieff upon the action of a high temperature upon alcohols. Since the researches of Berthelot upon the substances produced when various substances are passed through red-hot tubes, very little work has been done in this direction. It is now found that in the case of alcohols the reaction is a much simpler one than would be expected, the corresponding aldehyde being the chief product. In many cases the yields are so good that it forms an advantageous method for the preparation of certain aldehydes. The hot tube may be of glass or iron, preferably the latter, the temperature giving the best yields being about 700°. Methyl alcohol treated in this way gave 25 per cent. of the theoretical quantity of formaldehyde, isobutyl alcohol about 40 per cent. and isoamyl alcohol 30 to 40 per cent. of the corresponding aldehydes.

OWING to the fact that the values obtained for the atomic weights of iodine and tellurium are inconsistent with their relative positions in Mendeléeff's table, numerous determinations of the atomic weight of the latter element have been made in recent years, the results obtained varying between 127·5 (Staudenmayer) and 128 (Wills), all being above that of iodine (126·8) instead of below it as required by the periodic law. As is pointed out, however, by Herr O. Steiner in the current number of the *Berichte*, all these determinations of the atomic weight of tellurium are based upon the analysis of inorganic preparations, the methods of purification adopted giving no complete guarantee that small quantities of substances of similar properties but different atomic weights may not be present. The fact that tellurium forms a stable and well-defined diphenyltelluride, $Te(C_6H_5)_2$, distilling without decomposition in a vacuum, was therefore utilised for a fresh determination. Although these preliminary results have not the high degree of precision necessary for the complete resolution of the problem, Herr Steiner points out that the accuracy obtainable by an ordinary combustion is sufficient to fix the atomic weight of tellurium to within 0·5, and several results obtained by combustion of the carefully fractionated product gave a mean value of 126·4, a figure much lower than those mentioned above and agreeing with the prediction of the periodic table. As a confirmation of the method, a similar set of experiments upon diphenylselenide gave the values 78·8 and 79·3, the number usually adopted being 79·1. The results of more exact determinations carried out upon material purified by this method will be awaited with interest.

THE additions to the Zoological Society's Gardens during the past week include a Dingo (*Canis dingo*) from Australia, presented by Mr. W. R. Temple; a Pinche Monkey (*Midas aedipus*) from Colombia, presented by Lady Moor; a West African Python (*Python sebae-natalensis*) from Natal, presented by Mr. Alex. Buchanan; a Spotted Ichneumon (*Herpestes auropunctatus*), four Hamilton's Terrapins (*Damonia hamiltoni*), seven Bungoma River Turtles (*Emyda granosa*), eight Roofed Terrapins (*Kachuga tectum*) from India, a Common Boa (*Boa constrictor*) from South America, deposited; a Maguari Stork (*Dissura maguari*) from South America, four Gouldian Grass Finches (*Poëphila gouldiae*) from Australia, purchased.

OUR ASTRONOMICAL COLUMN.

NOVA PERSEI.—Prof. H. C. Vogel describes, in the *Astronomische Nachrichten* (Bd. 154, No. 3693), the results of measures of photographs of the spectrum of Nova Persei, taken with the 80 cm. refractor and spectrograph of small dispersion. The spectra extend from λ 3740 to λ 5800. Wave-lengths have been determined by comparisons with the spectrum of β Orionis (Rigel). Tables of the wave-lengths of the deduced lines are given, the origins being traced to hydrogen, calcium, magnesium and silicon. The displacements of the lines is shown to indicate a velocity of some 700 kilometres per second relative to the earth; an exception to this occurs in the case of the two calcium lines at H and K, which are indicated as giving velocities of approach of only 45 kilometres per second.

VARIABILITY OF EROS.—At the Lyons Observatory MM. Guillaume, Le Cadet and Luizet have recently obtained a series of estimations of the variations in the brightness of Eros, observing with an equatorial coudé of 0·32 metre aperture and a Brunner equatorial, 0·16 metre aperture. A diagram of the light curve is given. This is similar to that of β Lyræ, but the secondary minimum is almost equal to the principal one. The determinations gave

h. m.
Principal minimum to secondary minimum = 2 51
Secondary ,, principal ,, = 2 24
Principal maximum to secondary maximum = 2 50

Details of estimates on seven nights during February are given (*Comptes rendus*, cxxxii. pp. 530-531).

In the same issue M. Luizet gives the elements for computing future minima as follows:—

h. m. h. m.
1901 Feb. 20. ... 7 57 } +5 16·15 E.
20. ... 10 48 }

The eccentricity of the orbit of the system would thus be about 0·0569, which is nearly equal to that of the moon's orbit (0·0549).

In the current issue of the *Comptes rendus*, M. L. Montangerand describes the photographic investigations which have been made with the astrographic refractor at the Toulouse Observatory. It is interesting to note that the measures so obtained agree very well with visual determinations. The planet was allowed to trail over the plate, and the points of equal brightness marked off at intervals. The period thus found is given as 2h. 38m. (2h.·63) (*Comptes rendus*, cxxxii. pp. 616-618).

In close agreement with this result is the determination of Prof. Deichmüller at Bonn, who gives 2h. 61 as the period of variation. This observer gives also, for the two evenings of February 21 and 22, a series of estimations of magnitude at intervals of ten minutes from 5·0 to 10·0 p.m. (*Astronomische Nachrichten*, Bd. 154, No. 3693).

NEW VARIABLE, 2 1901 (CYGNI).—Dr. T. D. Anderson announces, in the *Astronomische Nachrichten* (Bd. 154, No. 3692), the discovery of a new variable star. Its position is

h. m.
R.A. = 19 12·2 } (1855·0).
Decl. = + 49° 55′ }

And the variations recorded are

1900 Dec. 26 ... 9·5
1901 Jan. 12 ... 9·8
Feb. 16 ... 10·4

OBSERVATIONS OF CIRCUMPOLAR VARIABLE STARS.—Vol. xxxvii. part 1 of the *Annals* of the Harvard College Observatory contains the results and discussion of the observations of 17 circumpolar variables made at the institution during the period 1889-1899. The estimates of magnitude were made by Argelander's method, but differ from similar observations of other workers in two respects—first, the stars have been observed throughout the whole period of their variation of light; and second, all the observations have been reduced to a uniform photometric scale, that of the meridian photometer. This latter peculiarity is of great importance, as by its means the stars can not only be systematically compared *inter se*, but collateral comparisons made with stars of constant brightness in any part of the sky. Both the 15 inch and 6-inch equatorials have been employed in the work.

Three of the stars, T Persei, S Persei and R Ursæ Minoris appear to be irregularly variable. With the exception of these, mean light curves have been deduced for the variables, and tables are given showing the phases obtained by this means. An examination of the curves shows that the principal maximum is in several cases preceded, and in a few cases followed, by a more or less marked *secondary* maximum.

Treating these variables as a class, it is noted that the

mean of all the periods ... = 363·4 days
mean magnitude at maximum = 7·81
,, ,, ,, minimum = 12·64
So that the range is therefore = 4·83 magnitudes.

Drawings are given of the mean light curves of 14 of the variables, and 16 small charts showing their positions with respect to the surrounding stars.

EROS AND THE SOLAR PARALLAX.

FEW projects involving long continued observation and laborious calculations have received a more ready assent or commanded a wider co-operation than that which has for its aim the determination of the solar parallax from observations of the planet Eros. This readiness to adopt a general programme was materially assisted by the meeting of the International Astrophotographic Congress at Paris, in July 1900, whereby the directors of many of the best equipped observatories were able to rapidly mature their plans and to complete the necessary organisation. The representatives of some twenty observatories gave in their adhesion to the proposal, which contemplates the collection of measures, either photographic, micrometrical or heliometric, and the necessary meridian observation of a large number of comparison stars. The general scheme follows the well-known lines of utilising observations made at considerable hour angles east and west of the meridian at any one observatory, of combining the observations made in the north and south hemispheres, and adds the somewhat novel feature of making available simultaneous observations of the planet at stations in America and Europe, a suggestion which, among other advantages, has the effect of eliminating errors arising from an imperfect knowledge of the planet's motion.

Under date, Paris, January 31, M. Loewy gives an interim report of the progress of the observations up to the end of the year 1900. M. Loewy and those responsible for the inception of the scheme are to be congratulated on the energy exhibited and the hopeful results obtained. The report states that, notwithstanding the bad weather that has generally prevailed in the northern regions of our hemisphere, not one day has passed in which the planet has not been observed by one or other of the several methods adopted. The number of coincidences of observation between the three contributing American observatories and those in Europe is shown by the following figures:—

Number of Coincidences up to December 31, 1900.

	Madison.	Washington.	Williams Bay (Yerkes).	Total.
Micrometric	40	49	106	195
Photographic	15	30	66	111

The English observatories of Oxford and Cambridge (Greenwich is not reported) are in the least favourable position, since the arc of the Great Circle intercepted between them and the average American station is only about 55°; but seeing that the parallax of the sun can be determined quite independently of the motion of the planet, and that the stars of comparison will be the same in the two cases, a very small error can be anticipated under the least favourable conditions. Considerable attention has been given to the amount of this error, and one